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ABSTRACT

Basic questions about the concept of learning style are addressed in this paper along with several ideas about the learning process. Additionally, a psychophysiological developmental experience model of learning and learning style is presented. Included in the discussion is a comprehensive definition of learning style that encompasses elements of previous definitions and is intended as a guide for research efforts and practical applications in early childhood programs. Eight subsequent sections are devoted to specific ideas about the learning process: reduction of entropy, bias against redundancy, self-consciousness and reintegration with the universe, the individual decision to move toward either biophilia (love of life) or necrophilia (affiliation with death), intentionality/expectation and causation, patterning in the universe, interaction and meaning in systems, and generative learning. In a ninth section, a different focus on learning processes is proposed for professional education. Contributions of psychophysiology, life-span human development, and environmental/cultural experiences to the interdisciplinary and ecological model of learning processes are pointed out. The concluding section discusses relationships of world view to learning style. (RH)

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Learning Style: A Point of View for Valuing Young Learners

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Learning Style: A Point of View for Valuing Young Learners

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Learning style is an idea that has recently become popular. It is useful as a means of recognizing and providing for differences in young learners. The learning style concept is an affirmation that,in the area of learning, the uniqueness of each individual is a positive attribute which must be valued and nurtured. To do an effective job in applying learning style to early childhood education several questions need to be answered. Then an appropriate model is needed to guide program,planning and research.

1. What is learning style?

A definition is needed that points toward an effective model. Several definitions have been offered in the literature. At first,the definitions may seem to be diverse. Actually the definitions appear to emphasize one of two ideas: (1) learning style is viewed by some writers as the preference a student has for conditions in the learning environment (e.g., amount of light or sound, more or less structure provided by the leader, working alone or with others), (2) learning style is defined by others as a pervasive and consistent approach to tasks (e.g., seeking concrete experiences, wishing to know what is expected by superiors, wishing to try new and different ways to do something).

I propose a more comprehensive definition, one that encompasses elements of other definitions and one that can guide research efforts and practical applications in early childhood programs. Learning style is the consistent pattern of behavior and performance by which an individual approaches educational experiences. It is formed in the deep structure of neural organization and personality which molds and is molded by human development

variables and cultural influences of experience in the home, school and society. An individual's learning style is consistent with the general expectation that the individual brings to an experience and the strategies by which he or she constructs personal meaning from the experience.

2. Who has a learning style?

Learning style applies to adults (parents and teachers) as much as to young children because as adults we continue to be learners. In addition learning style is related to roles of adults (such as parent or teacher) which are related to learning. For example we usually approach teaching something to children in very much the way we would go about learning it ourselves. Even when we are aware that the learner has different developmental or background needs, our natural inclination is to believe that everyone learns as we ourselves learn, and we behave accordingly.

3. How does a person get his/her learning style?

Individuals develop and exhibit a learning style rather early in life. The blueprint is laid down through inheritance and probably some prenatal influences such as maternal nutrition, drugs or medication and stress. That with which one is born with provides a predisposition toward a consistent learning pattern, but it is only the beginning. Development produces change during childhood. For example, Piagetian cognitive developmental research has demonstrated that children think in qualitatively different ways as they grow older. But, however, developmental changes continue throughout the lifespan. As Hultsch and Deutch (1980) point out, we are influenced developmentally throughout life by both normative and nonnormative factors. Normative factors include chronological age and the cohort group to which we belong. That is, persons born in the 1930's belong to the cohort group of the depression which had a distinct influence on that generation. But babies born in the 1960's have a different set of influences. In a word, what you are now is partly the result of what you were when ... Nonnormative

influences include the unique set of life experiences an individual encounters. Therefore an individual's learning style may be expected to reveal consistency based on deep structures such as neural organization or personality and gradual changes consistent with lifespan development and life experiences.

4. How flexible is a learning style?

It seems reasonable to expect dimensions of both consistency and flexibility in a person's learning style. Those factors most deeply embedded within the individual are likely to be most enduring. For example, an individual whose neural organization provides strong spatial ability is likely to reveal that strength in learning tasks very consistently. A person whose personality is very introverted is likely to reveal that orientation rather predictably. That is, such components tend to provide the limits and the general approach which the individual is likely to employ in learning. We often "know" a person by these basic dimensions of individuality. For example we say "He is a very quiet person" or "She is unusually good at imagery in solving spatial problems." On the other hand, all individuals can and do adjust to task demands or requirements of the learning environment. In one sense, this is what we mean by "learning how to play the learning game." But sometimes the apparent flexibility seen in the overt learning behavior misleads the observer. When one finds out the strategies the individual actually used in completing the tasks the basic learning style is often preserved. Certainly it is desireable for individuals to have flexibility in utilizing a variety of learning styles that are efficient for learning tasks. Becoming aware of one's own learning style is the first step toward becoming more adaptively efficient.

5. How may learning style be measured?

Learning style has frequently been measured by self report instruments that ask the respondents to indicate a preference for learning conditions or to describe characteristics of their own learning. Unfortunately these measures reveal little about the substraits of such preferences or descriptors. In addition, responses at the self report level are likely to be highly labile and situation specific.

I propose that the learning style construct will be better served by using, possibly in combination with self report devices, performance measures that reveal the substraits of patterns in learning behavior. My recommendation offers two advantages. First, performance measures reveal what people actually do in learning situations rather than what they recall or imagine to be the case about their patterns in learning. Therefore, the data would be closer to "real world" learning behavior. Second, the assessment of substraits of learning patterns provides information about deep and enduring learning structures within the individual that have value for predicting the individual's characteristics learning behavior. Such data will, moreover, suggest the adaptive range (lability) that we might expect from the individual when confronted by varied learning task demands. The performance substraits which I propose are (1) patterns in brain functioning during cognitive activity and (2) selected cognitive dimensions imbedded in personality, such as anxiety, tempo, locus of control, field dependence-independence, spatial ability, emotionality. The proposal requires justification in a comprehension model of learning style. That model is discussed in the section which follows.

6. what are components of a model which can explain learning style in young children and adults?

Man is a pattern seeker. From the dawning of self-consciousness when man first considered the possibility of mind, there is evidence of his attempts to build models of the mind and how it works. What is mind? That question, probably the first truly philosophical one, raises another: can the mind know itself? If one proceeds from the position that man is his own metaphor, the answer is that he can approach understanding the mind at a variety of levels.

Models of the mind are frequently constructed from assumptions and conceptions derived from a particular perspective. For example, suppose one illuminates three hidden solids (a cylinder, cone and sphere) from overhead and observes only the shadows cast. All the shadows are circles. A model built from that perspective would assume that all the objects are alike. Within the constraints of the single perspective, the model is "accurate." But all that is needed to suggest another more comprehensive model, is to illuminate the hidden objects from any horizontal perspective. Then the shadows cast are a rectangle, triangle and circle (Hampton-Turner, 1981).

We propose that building a comprehensive model of learning style requires multiple perspectives and continuing revision as compelling evidence and ideas become available. Thus it is a plea for connectedness, integration, generativity and ecology versus the reductionism, fragmentation and compartmentalization which characterizes so much of prevailing orthodoxies.

1. Reduction of entropy

To cope successfully with a complex environment, organisms are impelled to reduce uncertainty and confusion (reduce entropy) throughout the life-span, (Cannon, 1939). Patterns are sought from which reliable expectations may be built. Biological systems function on the basis of organization of elements operating within defined parameters. Learning is also characterized by the attempt of individuals to "get it all together." For the infant it may be the process of bonding or learning to walk; for the adult it may be puzzling about interpersonal communication or computer programming, but the drive to reduce uncertainty is the same. It is easy for us in education to identify with the psychobiological notion of entropy reduction. It fits our model of "schooling." Bias against redundancy is not so readily accepted.

2. Bias against redundancy

Given a series of stimulus events, a muscle neuron which has just "fired" is less likely to fire again when the same threshhold level of stimulus is applied, but another neuron, to which the stimulus is novel is more likely to fire, (Sherrington, 1947). Thus it appears, at the level of neurons, that a bias against redundancy (sameness) is built into the biological structure of organisms. When the analogy is applied to learning, it suggests that build into individuals, there is a basic capacity to seek novelty, to avoid boredom.

Meyer (1980) has suggested a relationship between ideas one and two. On the surface, they seem antithetical; yet they are complementary. A life-sustaining predictability frees us to deal with the novel. Exploring novelty leads to establishing apprehension of new regularities. We often express the balance between these two ideas of an individual's

orientation and behavior in terms of risk taking or resisting change. For a theory of motivation in learning it would be useful to explore the factors that shift the balance between entropy reduction and bias against redundancy (seeking novelty) in the behavior of individuals.

3. Self-consciousness and reintegration with the universe

Erich Fromm (1964) has proposed that humans lost identity with nature when they became self-conscious and aware of their identity as entities separate from one another. He suggests that we endlessly search for reintegration with the universe as relief from the loneliness of self-consciousness. In what way does the drive for reintegration contribute to the value an individual ascribes to learning in the natural sciences and in the social sciences, to direct personal experience in nature or with another human being? How does the ontogenetic development of self-awareness and striving for personal identity interact with the phylogenetic development of self-consciousness and striving for reintegration with the universe? (Teilhard de Chardin, 1959).

4. Decisions: movement toward either biophylia or necrophylia

An individual's movement toward either fullness and love of life (biophylia) or toward decay and death (necrophlia) has been proposed by Fromm (1964) as a function of decisions and choices made on a day-by-day basis throughout life. It would appear that the individuals utilization of choices and opportunities available for continual learning would be important variables in determining a person's changing status across the biophylia - necrophylia continuum.

Fromm's biophylia-necrophylia continuum has broad implications for learning. An individual's choices in action or perception in response to daily life events move the person toward one or the other end of the continuum; but more importantly, the new position on the continuum becomes the individual's vantage point to view the next life event. Gradually individuals may develop a generalized and encompassing view of the world, life events and learning that is highly characteristic of one end of the continuum. The individual's world view strongly biases his or her perceptions of and expectations in future life experience. As we shall point out in assumption ten the individual's world view heavily influences what and how an individual learns (the learning style).

5. Intentionality/expectation and causation

Recent investigation of the concept of personal causation and life control suggests that the quality of an individual's performance is positively correlated with his perception of the degree to which he has control over and responsibility for life events (DeCharms, 1976). In the most general sense, then, expectations tend to become realities.

The function of expectancy in learning is complex and not yet well understood. Brain functioning research offers some hypotheses. Sensory pathways to the cortex first pass through a complex system deep in the midbrain called the reticular activating system (RAS). The RAS has a "gating" capacity, such that it either arouses the brain by sening sensory stimuli upward or stop the signals thus preventing conscious awareness of the stimuli. This process is intimately related to learing, because only that information which passes through the RAS receives the individual's conscious attention. However, it should be noted that

information which is not relayed upward to the cortex may be processed lower in the brainstem. Recent evidence has suggested that important learning does occur in the brainstem (Tuber et al., 1980).

What causes the RAS to stop or send on sensory information is still a puzzle. Emotion and small cognitive mismatches (discrepancies) in the current experiences, compared to past experiences, seem to open the RAS gate (Young, 1978, Rowe, 1978). We also know that strong neural pathways extend downward from the frontal lobes of the brain to the RAS (Thompson, 1975). The frontal lobes seem to be associated with planning (foresight) and intentionality in man, perhaps expectancy in learning operates through influence by the frontal lobes on the RAS function of gating incoming information. If that is the case, we have a psychophysiological like between expectancy and attention in cognition.

Research concerning locus-of-control indicates that an individual's life control expectancy and sense of personal causation have developmental strands which extend into early childhood (Perimuter and Monty, 1980; Wolfe, 1976). From a life-span perspective on learning, it seems important to investigate the development of expectancy and intentionality (Rowe, 1978). Not only is this relevant for cognition, but it may also be related to the individual's perception of the choices he/she has, as discussed above, with respect to Fromm's concept of biophylia/necrophylia.

6. Patterning in the universe

In the ontogenetic development of organisms, and throughout the cosmos, organization and pattern seem inevitable to emerge (Piaget and Inhelder, 1969; Jung, 1959; Levi-Strauss, 1963, 1976; Wolpert, 1979; Raychaudhuri, 1979). To some degree we impose order on experiences: Man seeks synergy

(Hofstadter, 1979). And as an assumption about lifelong learning, the concept of patterning is very useful. Patterning seems to develop in three successive cognitive phases or levels. Patterns are sensed first at the pre-conscious levels. For example, young children develop meanings motorically through direct interactive experiences (Bruner, 1975; Nelson, 1974; Piaget, 1959). Children frequently recapitulate the motor experience in a kind of charade as they attempt to express it in words (Britton, 1970). Later the idea is expressed verbally and/or spatially, providing abstract representation of the experience and the capacity to generalize, i.e. to express the pattern (Vygotsky, 1962; Papert, 1980). The final level of patterning in learning is to construct or synthesize patterns (Wittrock, 1980; Rothenberg, 1980). Creative dance movement, architectural design, and conceptual models are illustrations of pattern building. Patterns abstracted from experience are a very useful way for man to reduce entropy.

It is important to emphasize in this discussion of patterning in learning that patterns require a basis in direct motor (muscle) experience. Pearce (1974) suggests that the emphasis on verbal capacity in our culture and schools often leads individuals to employ verbal representation of patterns without having first experienced or understood the basis of the pattern. As a result individuals engage in "roof brain chatter" because it is a means of power and succeeding in the system; but in the process they lose authenticity. Perhaps terminology sometimes used loosely in professional literature (e.g. educational jargon) is a case in point.

7. Interaction and meaning in systems.

An important notion in physical and mathematical science is systems theory. In a simplified way "system" is defined as a set of elements

which mutually influence one another. Thus a system represents a force network.

The systems construct has been applied successfully in ecological approaches to biology and the environment. Bronfenbrenner (1979) uses the systems model to explicate an ecology of human development. He suggests that interaction in human development may be investigated at several levels: micro-, meso-, exo-, macro- systems.

A provocative component of Bronfenbrenner's mode is his set of hypotheses about the impact on learning of interaction between members of dyads. Dyadic interaction has important meaning not only in early life (e.g. parent-child interaction) but, all along the life-span. For example adult development research (Levinson, 1978) reveals that successful adults have established one or more mentor relationships (dyads). We know very little about mentor dyads - how they are established, how they function, how they end. At what points in life-span development does one assume the role of mentor? What makes an effective mentor? It appears that many mentor-mentored dyads end with some conflict. Is this stress developmentally inevitable?

8. Generative learning

The generative model of learning has been explicated by Wittrock (1980). In contrast with strict behaviorism, generativity suggests that throughout life individuals create meaning in experience. People are largely in control of and responsible for their own learning.

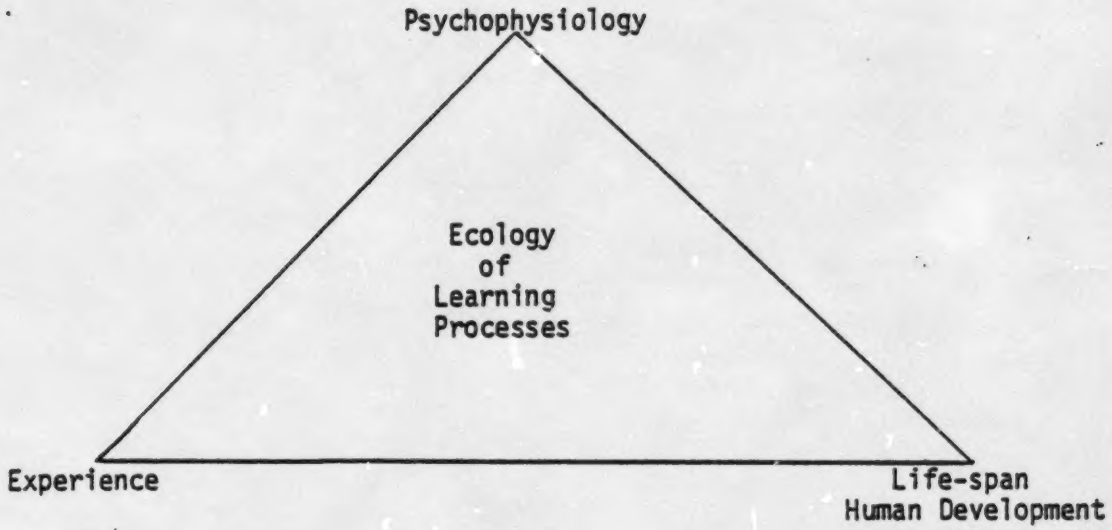
The generative model comprises many elements in the cognitive movement in instruction. It proposes new approaches to view perennial concerns of learning across the life-span: motivation, attention, affect,

memory and concept formation. Even the basic construct of mental representation of experience is strongly influenced by a generative model of learning. Further, this model interferes nicely with models of brain functioning.

Brain models propose that patterns of neurological organization, development and function may provide the psychophysiological substrates which interact differently in experience to provide qualitatively different outcomes in learning. Thus the generative model of learning, combined with models of brain functioning, provides a new paradigm for understanding individual differences (Languis, Sanders and Tipps, 1980).

9. A psychophysiological - experiential - developmental model of learning processes.

In thinking about and researching the educational process we have characteristically focused on teaching. Further we often consider teaching from rather narrowly defined "institutionalized" perspectives: instruction, curriculum, administration, evaluation and schooling. The ultimate goal of educational practice for its clients is learning. Yet an explicit understanding of learning is missing when we focus on a narrow view of teaching. We propose a new focus on learning processes for professional education. Moreover, the assumptions discussed in this chapter suggest that learning processes should be investigated from a broad interdisciplinary and ecological model. Our model of learning processes highlights three major components: psychophysiology, life-span, human development and experiences.



Psychophysiology contributes neurological, biological and genetic concepts to the study of learning. Recent brain research has provided several models of brain-body learning: hemispheric model (Sperry, 1969) evolutionary model, (MacLean, 1978) neuro-chemical model, (Shapiro, 1976) programs of the brain model, (Young, 1978, Hebb, 1949) functional block model (Luria, 1973). In a broad sense, insights into brain functioning has begun to resolve the traditional mind-body dichotomy by suggesting how mental activity and neural activity are related. In more specific areas, brain functioning has generated new hypotheses about such areas as motivation, attention, memory and individual differences in learning style.

Psychophysiology helps up expand our understanding of how human development affects learning processes. The maturation and functional development of the central nervous system may now be considered components of learning in human development across the life-span. Similarly psychophysiology and experience are related, particularly in the formation of brain programs. Hebb (1949) suggested that networks of neurons become functionally established through experience. In this sense neural

networks represent learning and enable organisms to carry out complex behaviors routinely. Young (1978) expanded the programs of the brain model to suggest that our expectancies and even our values are directly related to the building of some brain programs and the extinction of others.

Experience contributes the familiar environmental-cultural component to the study of learning processes. However the term experience, rather than environment, is appropriate for an ecological model of learning. Environment connotes a static view of that which surrounds the individual. Experiences suggests that the interaction of the individual with the surroundings is what makes the environment important to learning (Hunt, 1979). Certainly the experience of each individual in a particular environment varies from that of other individuals in similar environments. Psychophysiological and human development factors interact with past experiences to account for much of the differences in experience.

Further, life-span human development contributes such constructs as total organism, growth and change to a model of the study of learning processes. A developmental point of view, especially a life-span human development perspective is isomorphic with an ecologial model of learning. In fact, a developmental perspective requires that primary consideration be given to the interaction of psychophysiology experiences along with developmental parameters in attempting to understand learning processes.

Human development models are characterized by typologies of stages which are qualitatively different from one another and through which an

individual proceeds of an invariant sequence. Recent studies of development during adulthood (e.g. Levinson, 1978; Lowenthal et al., 1975; Gould, 1978) suggest that human development, often assumed to be completed in adolescence, continues throughout the life-span. These investigators apply the familiar paradigm of developmental "stages" or "tasks" to adult life, but the transitions between them are sensitive times. Riegel (1975) proposed a human development dialectic which involves interactions between the inner-biological, psychological, cultural-sociological, and physical-environmental dimensions. In this scheme, positive resolution of conflict leads to growth while failure prevents progress in development.

Thus, just as the young child is changing developmentally in various areas (e.g. physical, cognitive, social), so the important adults (teachers, parents) in his/her life are likewise individuals undergoing development. Viewed developmentally, interaction within these adult-child dyads in daily life expericnes provides a powerful model for study and application in the early childhood learning contexts of home and school.

Other contributors (e.g., Kimmel, 1974; Goldberg and Deutsch, 1977) describe adult development not in terms of stages but rather with a focus on change in significant life events and roles -- e.e. marriage/divorce/remarriage/widowhood; becoming a parent/empty nest; entering/building a career/retirement. This role-change model of adult development is built heavily from a social-behavioral science perspective; as such the sequence and timing of adult development would be heavily depent on environment. From this perspective of life-span development,

sensitive periods are associated with the stress and strain of life change events.

The role change model may have another dimension. As an individual takes on or gives up an adult role (e.g., parenting), that life-change may serve as a catalyst for latent memories of others who experienced the same role change. A new level of empathy, understanding, and identity may be fostered. For example, individuals experiencing such role changes may comment "Now I really understand what it must have been like for my parents."

At the surface, it may appear that this merely illustrates the Native American adage about "walking a mile in another man's moccasins." There is a bit more to the idea, however. The identification with roles of others can be understood more profoundly as an identification with generic, universal human roles (e.g. parenting). In that sense the catalytic impetus of role change is toward the individual's broadening identification with membership in mankind.

Accepting or leaving life roles does not automatically produce understanding and empathy with others who have also experienced such life changes. An individual's capacity to learn from role-change experience seems in part to be related to where the person is chronologically along the life-span. The timing of role changes interacts with other aspects of adult development such as acceptance of responsibility or the level of one's achievement in career.

In concluding this section, we suggest an interactive biodynamic model of life-span development. Developmentalists often equate the life-span with the biological concept of life cycle which can be represente diagramically as a closed circle. Functionally, we believe

the developmental life-span extends beyond the 360° of a circle and is best imaged as some segment (more from 360°) of a continuing spiral. Life-span development represents movement along a three-dimensional spiral. Life-span development represents movement along a three-dimensional spiral rather than an eventual return to the beginning of the life cycle. This spiral model provides a context for understanding interaction of early and later life events, which may be viewed as strands which connect points along the life-span. These points of interaction, because they incorporate experiences with other people who are at different points on their life line, would extend beyond the spiral into an n-dimensional reality.

If we are to understand the implications of human life span development perspectives for early childhood education, it is important to examine some basic assumptions about learning and to consider them from a life-span point of view.

10. World view and learning style.

As suggested earlier one's world view is a composite constructed from psychophysiological, developmental and experiential components. Thus world view broadly defines the pattern of expectancy and characteristic approach the individual brings to learning situations (i.e. learning style). Learning style therefore needs to be conceptualized in forms of deeply embedded structures within the individual. This definition of learning style suggests that we will not make lasting contributions to educational practice by diagnosing learning styles on the basis of self report measures of sensory modality preferences or students preferences for environmental conditions (e.g. light, sound) or other specific aspects of the learning environment. The definition also suggests that learning style is a reflection of basic and deeply embedded

structures that comprise individual differences.

As such the individual's learning style is rather stable but is not fixed (Bem and Allen, 1974). First, any individual's world view is broad enough to allow the individual to adapt somewhat to the conditions of a particular learning situation. There is some range of accommodation within each individual's learning style. But the nature of that adaptive range will vary among individuals. Moreover, the manner by which each individual adjusts will be unique to him or her. Therefore we need to look beyond surface features and behaviors to understand the learning processes an individual employs in adapting his/her learning style to cope with educational tasks. Second, a life-span development perspective suggests that individual world view and learning style is modified gradually and developmentally.

Persons interested in the substrates of learning processes applied to the study of learning styles may find it useful to investigate areas reflecting deeper dimensions of individual learning such as the following:

Characteristic approach to tasks, e.g. sequential and analytical, simultaneous and holistic orientation to and interest in classes of events, such as spatial constructive, verbal communicative, emotional level

Sensitivity and responsiveness to people, and/or other aspects of the environment

Sense of humor

Anxiety level

General level of arousal and energy, physical movement pattern

Flexibility in degree and frequency of making adaptive shifts

Risk-taking or orinetation to diverge from convention

Confidence in and acceptance of self as a personal causative agent

Capacity to focus attention

Intensity

Persistence

Tempo and pacing in learning tasks

Decision making strategies

In conclusion, the notion of building models of the mind and how it works has been approached as an expression at the historic orientation of man to seek and develop patterns. A model of learning style built from this framework will necessarily be multifaceted and emergent. Ten conceptions about the learning process drawn from multidisciplinary perspectives have been briefly discussed. A psychophysiological-developmental-experience model of learning and learning style reflecting these conceptions has been offered as a basis for research activity.

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